REMARKS/ARGUMENTS

This is a Response to the Office Action mailed July 15, 2003, in which a three (3) month Shortened Statutory Period for Response has been set, due to expire October 15, 2003. Fifteen (15) claims, including one (1) independent claim, were paid for in the application. Claims 1, 3-5 and 8-9 have been canceled. Claims 2, 6-7 and 10-13 have been amended. No new matter has been added to the application. No fee for additional claims is due by way of this Amendment. The Commissioner is authorized to charge any fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090. Claims 2, 6-7 and 10-15 are pending.

Priority

The Examiner indicates that the current status of all nonprovisional parent applications referenced has not been included. Priority information was submitted using the Application Data Sheet form provided by the U.S. Patent and Trademark Office, which does *not* have any provision or field for entering of the current status of a domestic priority application. Applicants note, however, that the instant application is a continuation-in-part of U.S. Application Serial No. 09/758,871, which issued on September 3, 2002, as U.S. Patent No. 6,445,095.

Rejections Under 35 U.S.C. § 112, Second Paragraph

Claims 8 and 9 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to point out and distinctly claim the subject matter which the applicant regards as the invention. Claims 8 and 9 have been canceled.

35 U.S.C. §§102(b)/103(a) Rejections

Claims 1-3, 7, 8, 9 and 12 were rejected under 35 U.S.C. §102(b) as being anticipated by Macha et al. (U.S. Patent No. 3,155,856). Claims 1, 3 and 4 were rejected under 35 U.S.C. §102(b) as being anticipated by Eis et al. (U.S. Patent No. 3,075,107).

Claims 4 and 5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Macha et al. (U.S. Patent No. 3,155,856) in view of Kinoshita et al. (U.S. Patent No. 5,789,833).

Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Macha et al. (U.S. Patent No. 3,155,856) and Jefferies (U.S. Patent No. 4,054,809).

Claims 10 and 11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Macha et al. (U.S. Patent No. 3,155,856).

Claims 13 and 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Macha et al. (U.S. Patent No. 3,155,856) and Robinson et al. (U.S. Patent No. 3,525,889).

Claims 13-15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Macha et al. (U.S. Patent No. 3,155,856) and Kusumoto et al. (U.S. Patent No. 5,576,584).

U.S. Patent No. 3,155,856 issued to Macha et al. (hereinafter Macha) is generally directed to providing a preferred heat flow path in an electric machine, extending from the end windings of a stator to a heat sink formed as a portion of the housing. In particular, Macha teaches the use of heat collector rings 78, 80 formed from any suitable material having a high thermal conductivity, for example, copper. Macha, col. 5, lines 42-73. Macha also teaches the use of a suitable potting compound that is electrically insulating and has good heat transfer characteristics and that is "disposed in all the voids existing within the stator cavity 25." Macha, col. 6, lines 23-39. The potting compound is introduced in a free flowing form and then is cured until solidified. Macha, col. 6, lines 40-56.

U.S. Patent No. 3,075,107 issued to Eis et al. (hereinafter Eis) is generally directed to improving the heat transfer characteristics of a canned motor. In particular, Eis teaches a multi-element heat transfer structure that includes a pair of cylindrical rings 52 adjacent the end turns 22, a mica flake composite 54 or other insulation positioned to form a dam with the cylindrical rings to receive a potting compound and filler 53, and a chill ring 58 comprising a plurality of layers of rectangular shaped copper wire wound on a soft copper sheet. Eis, col. 3, lines 37-67; col. 4, lines 26-42. The potting compound has a high coefficient of thermal conductivity, and is cured into a hard substance. Eis, col. 3, line 69-col. 4, line29.

U.S. Patent No. 5,789,833 issued to Kinoshita et al. (hereinafter Kinoshita) is generally directed to a totally enclosed traction motor. In particular, Kinoshita teaches the use of cooling bodies as part of a motor housing, the cooling bodies 19 including a set of heat absorbing fins 19B extending into an interior of the housing and a set of heat radiating fins 19A extending into the ambient environment surrounding the exterior of the housing. The heat absorbing fins 19B are positioned within an air path (arrows) that passes by the stator coils 4. The fins 19A, 19B may be formed of a material with excellent heat conductivity, such as aluminum alloy. Kinoshita, col. 6, lines 14-18. Importantly, Kinoshita relies on air circulation for transferring heat from the stator coils 4 to the cooling bodies 19, in direct contrast to Macha and Eis.

U.S. Patent No. 4,054,809 issued to Jefferies is generally directed to a stator core end magnetic shield. In particular, Jefferies teaches a shield formed from wound small diameter wire that is either pre-insulated or insulated by a matrix of fiberglass. Jefferies, col. 3, lines 2-10. The fiberglass matrix may be impregnated with an epoxy resin to form a high strength support. Jefferies, col. 3, lines 13-16. Importantly, the shield does not form a heat transfer structure, but rather directs magnetic flux generated by the end turns to reduce that amount of heat produced at the end windings. Jefferies, col. 3, line 24-col. 4, line 5. This point becomes even more apparent when one notes that the shield employs fiberglass, which is not typically considered a good thermal conductor, and is in fact commonly marketed as a good thermal *insulator*.

U.S. Patent No. 3,525,889 issued to Robinson et al. (hereinafter Robinson) is generally directed to the selection of potting materials for bonding laminates and impregnating the winding on a stator core. In particular, Robinson teaches the selection of a potting material having a low modulus of elasticity rather than a low coefficient of expansion, in order to relieve stresses built in during formation of the structure. Robinson, col. 3, lines 2-41; and col. 5, lines 58-72. Robinson does *not* address the heat transfer characteristics of the potting material, and the only suitable material suggested by Robinson is a polyamide resin-epoxy mixture. Robinson, col. 7, lines 28-38. It is important to note polyamide is considered to be a good thermal insulator and is commonly marketed for its low heat transfer characteristics.

U.S. Patent No. 5,576,584 issued to Kusumoto et al. (hereinafter Kusumoto) is generally directed to the use of a viscoelastic resin to promote vibration absorption in an AC

generator. Kusumoto, col. 3, lines 20-29; and col. 4, lines 3-27. As in Robinson, Kusumoto is silent with respect to the desired heat transfer characteristics of the resin. Kusumoto appears to rely on air cooling (see Figures 1 and 2) via fins 16, 17, and in contrast to Macha and Eis does *not* employ any direct structural heat transfer path (conduction versus convection).

As rewritten in independent form, claim 6 recites, *inter alia*, "wherein the thermal conductor ring is a non-metallic thermal conductor ring disposed between the potted stator core end-turn and the housing." The Examiner contends that Macha teaches every aspect of the invention except the heat conductor ring being non-metallic. The Examiner further contends that Jefferies teaches a resin and wire end turn support to allow for temperature and flux flow to increase machine efficiency.

As noted above, Jefferies teaches a shield employing a matrix of fiberglass that is impregnated with an epoxy resin to form a high strength support. Jefferies, col. 3, lines 2-16. Importantly, the shield does *not* form a heat transfer structure, but rather directs magnetic flux generated by the end turns to *reduce* that amount of heat generated at the end windings. Jefferies, col. 3, line 24-col. 4, line 5. This point becomes even more apparent when one notes that the shield employs *fiberglass*, which is not typically considered a good thermal conductor, and is in fact commonly marketed as a good thermal *insulator*. Thus, Jefferies does *not* teach a suitable non-metallic material for forming a heat conductor ring, as recited in claim 6.

Further, Jefferies is unrelated to the problem of effectively transporting heat away from the end windings of the stator, which is the problem addressed by the Applicants and by Macha. Thus, Jefferies is non-analogous art with respect to the current claims and with respect to Macha.

Conclusion

Overall, the cited references do not singly, or in any motivated combination, teach or suggest the claimed features of the embodiments recited in independent claim 6, and thus such claim is allowable. Because the remaining claims depend from allowable independent claim 6, and also because they include additional limitations, such claims are likewise allowable. If the

undersigned attorney has overlooked a relevant teaching in any of the references, the Examiner is requested to point out specifically where such teaching may be found.

In light of the above amendments and remarks, Applicants respectfully submit that all pending claims are allowable. Applicants, therefore, respectfully request that the Examiner reconsider this application and timely allow all pending claims. Examiner Tamai is encouraged to contact Mr. Abramonte by telephone to discuss the above and any other distinctions between the claims and the applied references, if desired. If the Examiner notes any informalities in the claims, he is encouraged to contact Mr. Abramonte by telephone to expediently correct such informalities.

Respectfully submitted,

Feng Liang et al.

Seed Intellectual Property Law Group PLLC

Frank Abramonte
Registration No. 38,066

FA:lrj

Enclosure:
Postcard

701 Fifth Avenue, Suite 6300
Seattle, Washington 98104-7092
(206) 622-4900
Fax: (206) 682-6031

413314_1